

## Evans Succeeds Frost as ITTC Director

**Joseph Evans**, Deane E. Ackers distinguished professor of EECS, will become the new ITTC director, effective August 18. He will replace **Victor Frost**, Dan F. Servey distinguished professor of EECS, who announced last fall that he would step down after almost 11 years as director. During Frost's tenure, ITTC-affiliated faculty generated more than \$55 million in research expenditures. Frost will focus on his multiple research projects and teaching duties.



Evans

"With dedication to excellence and a strong vision focused on the continued growth of the Center, Victor led ITTC through most of its first decade," says **Keith Braman**, ITTC director of technology commercialization. "His insight and leadership helped the Center mature and establish a proven track record for innovative research, knowledge advancement, and technology commercialization."

Evans was acting director of ITTC from 1999

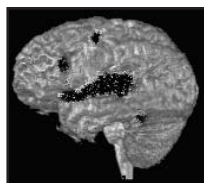
to 2000 and headed ITTC's Networking and Distributed Systems Laboratory for several years. He served as a program director at the National Science Foundation from 2003–2005 in its Directorate of Computer and Information Science and Engineering. Currently, he is KU's director of research information technology.

"KU is fortunate to have a researcher of Joe's caliber in this important role," said **Steve Warren**, vice provost for research and graduate studies, in a KU press release. "He's a national authority on the subject of research computing, and he has experience moving IT research into the marketplace. He also knows ITTC extremely well, so the Center won't miss a beat during the leadership transition."

A prolific researcher, Evans is helping redefine how people will use the Internet and wireless communication devices in the future. He has been the principal or co-investigator on numerous high-profile ITTC projects. ■

## Joint KU Effort Assesses Brain Mapping

University of Kansas researchers' analysis of methods for imaging the human brain in action was featured on the March cover of *IEEE Transactions on Biomedical Engineering*, a monthly peer-reviewed journal. Accurate mapping of brain activity could significantly aid in the understanding and treatment of Alzheimer's disease and other neurological disorders.



Researchers evaluated methods used in mapping brain activity during hearing, shown above, and other functions.

To better understand healthy brain function and changes caused by age and illness, investigators from ITTC and the Hoglund Brain Imaging Center (HBIC) at KU Medical Center assessed the benefits and deficiencies of existing processes used to create brain activity maps from magnetoencephalograph (MEG) brain scans. The KU research is described in the article "Spatio-Temporal Reconstruction of Bilateral Auditory Steady-State Responses Using MEG Beamformers."

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Would you like to learn more about ITTC? The 2007 Annual Report is now online at [www.ittc.ku.edu/about/ittc\\_ar07.pdf](http://www.ittc.ku.edu/about/ittc_ar07.pdf).

Director's News

I became acting ITTC director in January 1998, following **Sam Shanmugan**, the first ITTC director and Southwestern Bell distinguished professor of EECS. It was an exciting time for ITTC. The dot.com era was at its apex, and industry generously supported university research and development. Additionally, KU had identified information technology as a research emphasis; and a statewide committee, led by U.S. Senator Pat Roberts, seconded the importance of IT research. IT and ITTC were in the spotlight, relatively speaking of course.



Director Victor Frost

The Center developed numerous partnerships over the last decade that included federal and state agencies along with large corporations, smaller companies, and other research universities. Our state-of-the-art facilities helped investigators secure prestigious National Science Foundation, Department of Defense, and National Institutes of Health grants. One of our earliest collaborators, Sprint, gave ITTC access to real fiber on its network, an incredibly valuable and rare asset for a university-based research center. To date, the more than 15-year partnership with Sprint has produced seven U.S. patents and scores of technologies. Our most important technology transfer might be the many students who have participated in our research activities and gone on to join industry.

To position ITTC for future opportunities, we expanded our research activities. In FY 2003, we created two new laboratories, the Bioinformatics and Computational Life-Sciences Laboratory (BCLSL) and the Computer Systems Design Laboratory (CSDL). The latter has produced a start-up company, and we highlight the accomplishments of BCLSL on page 3. Our newest venture, radio frequency identification (RFID) research, has led to three licensing agreements with more expected to be signed.

As director, I hoped to foster a collaborative, multidisciplinary research environment at ITTC. With researchers from aerospace engineering, medicinal chemistry, computer science, computer engineering, education, electrical engineering, geography, and mathematics participating in Center projects, we have established such an environment. Our breadth of research gives students unique opportunities to explore a variety of interests. **Rory Petty**, a former ITTC student researcher now a systems engineer at Kenavision, said working at ITTC was the best part of his KU experience. He applied what he was learning in the classroom by helping develop and research cutting-edge technology. Former ITTC students lead programs at companies such as Sprint, Microsoft, and Intel. Others have become colleagues in academia.

The accomplishments of ITTC would not be possible without the hard work and dedication of faculty and staff. However, the fresh ideas and enthusiasm of our students have been key to the Center's success. As Joe takes over leadership of ITTC, we are assured that the Center will continue to excel and evolve. ■

# Hanson Retires

After 31 years of service to the University of Kansas, **Nancy Hanson** will retire at the end of the month.

Coworkers say they will miss her warm smile, willingness to help, and genuine interest and caring in others. Nancy's knowledge of grammar and attention to detail make her a superior editor and program assistant. In a building continually filled with new faces, Nancy serves as a go-to person and a keeper of our collective memory.

"It has been my pleasure, in all my years of service with KU, to work with the most congenial, talented, and professional staff and co-workers anyone could ever hope to find," Nancy says. "My work with ITTC has been varied, interesting, and educational: I will miss that, but mostly I will miss the people."

Nancy joined the Center for Excellence in Computer Aided Engineering (CECASE), a predecessor of ITTC, in January 1993. Prior to joining CECASE, Nancy worked at the KU Flight Research Laboratory and the School of Architecture. She earned a B.A. degree from Washburn University and has taken art and design courses at KU.

She plans to travel with her husband, Jerry, and to continue promoting environmental stewardship through her church and other activities. Nancy hopes to tackle several home projects as well as some new adventures. ■

**Information and Telecommunication Technology Center**  
A KTEC Center of Excellence at The University of Kansas

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# Bioinformatics Lab Receives National Acclaim

ITTC graduate student **Levi Pierce** was accepted into the physical chemistry Ph.D. program at the University of California San Diego, receiving a full stipend and fellowship. Pierce, who turned down offers from Wake Forest and Washington University, will conduct research with **J. Andrew McCammon**, an acclaimed professor of pharmacology, chemistry, and biochemistry. While obtaining his master's in computer engineering with a minor in biochemistry at KU, Pierce worked in ITTC's Bioinformatics and Computational Life-Sciences Laboratory (BCLSL). ITTC investigator **Terry Clark** mentored Pierce.

"Working with Dr. Clark is what really inspired me to apply my computational knowledge to biological problems," says Pierce.

BCLSL encompasses computer science, mathematics,



Photo by Megan E. Gannon

Levi Pierce stands next to the Bioinformatics Cluster, which facilitated his DNA research. His acceptance into an elite Ph.D. program is the latest success for the ITTC Bioinformatics Lab.

medicine, and other disciplines to analyze and present biological data emerging from the Human Genome Project and other research efforts. Established in 2003 as one of ITTC's newest focus areas, BCLSL research could lead to improved medical diagnoses, treatments, and a host of other benefits.

The new lab gathered great momentum with the creation of the Bioinformatics Computer Cluster Facility in 2004. Sponsored by the U.S. Army's Edgewood Chemical Biological Center (ECBC), the 384-processor cluster computer with 27 terabytes of on-line storage and a state-of-the-art back-up system supports life-sciences research across KU. BCLSL also grew by the association of researchers from KU's Molecular Graphics and Modeling Laboratory and its Bioinformatics Core Facility.

This past year the National Science Foundation (NSF) recognized BCLSL investigator **Xue-wen Chen** with a Faculty Early Career Development (CAREER) award. The award recognizes promising faculty members who will likely become the academic leaders of tomorrow.

Chen recently became the director of BCLSL. He will continue leading the development of superior collaborative research that has been the hallmark of BCLSL in its first five years. ■

## Joint KU Effort Assesses Brain Mapping

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While the better known CT and MRI provide a structural snapshot of the brain, a MEG scan details how the brain functions. The resulting map charts origins of activity and corresponding time sequences during cognitive functions.

According to **Mihai Popescu**, lead author and HBIC research assistant professor, there is growing interest in the assessment of speech comprehension and auditory processing as people age and for those afflicted with Alzheimer's disease. The effects of aging and Alzheimer's on brain function are research focus areas at HBIC.

More than 100 sensors within a MEG scan act as an antenna array to measure the magnetic fields produced by small electrical currents generated as neurons communicate. The collection of signals obtained by the sensors must be appropriately processed to generate an accurate image of activity. The determination of exactly how these signals should be processed is the focus of this

research, said **Shannon Blunt**, ITTC researcher in radar signal processing and co-investigator on the project.

"This is an antenna beamforming (a signal processing technique used to determine the arrival direction of signals) problem, which is common in the radar community. However, unlike radar where we're looking over a large area at some distance away from the antenna, the MEG sensors surround the head and effectively look inward at a very enclosed space. As a result, it's much harder to separate individual signals," Blunt said.

From their analysis of existing MEG image processing techniques, Blunt and Popescu, along with ITTC graduate student **Tszping "Charley" Chan**, recently developed a patent-pending method for MEG imaging, denoted as Source AFFine Image REconstruction (SAFFIRE), that has yielded unprecedented accuracy. Early results from this method have enabled the precise localization of primary and secondary auditory responses, a previously unsolved problem in the MEG brain imaging community. ■

# Achievements and Acclaim

## DePardo Receives KU Staff Fellowship

**Dan DePardo**, ITTC RF electronics engineer, was selected as a Staff Fellow for 2008–2009. The Staff Fellows program provides skill and leadership development and a broader knowledge of KU and higher education administration. The professional development program, which chooses 8–10 staff members each year, requires a proposal for an individual project and a supervisor's letter of endorsement with each application.

For his project, DePardo will conduct a technical overview of emerging wireless network technologies, such as WiMAX and WiFi Mesh, and how they can best support research efforts at ITTC. ■

## KansasBio Event Lauds Networking Project

Ph.D. student **Abdul Jabbar Mohammad** was among the winners at the “Capitol Graduate Research Summit” held in March at the Kansas Statehouse. The Kansas Bioscience Organization event showcased research posters from graduate students at KU, Kansas State University, KU Medical Center, and Wichita State University.

**Vinaykumar Muralidharan**, **Bharatwajan Raman**, **Victor Frost**, and principal investigator **James P.G. Sterbenz** were co-authors on the “Millimeter Wave Disruption Tolerant Mesh Networks,” poster. ■

## School of Engineering Honors EECS Faculty

ITTC researchers and EECS Assistant Professors **Shannon Blunt** and **Xue-wen Chen** received Miller Professional Development Awards and \$4,000 checks at the School of Engineering graduate recognition ceremony on May 18. Blunt collected the Miller Award for Research, and Chen earned the Miller Award for Service. School of Engineering faculty committees chose the winners. ■

# Tag with Agility Technology Debuts in August

ITTC has licensed manufacturing rights to its new Agility technology, which enables passive radio frequency identification (RFID) tags to perform reliably and efficiently in difficult environments, to Kansas City-based Starport Technologies.

“The performance of the Orion Tag using Agility technology is outstanding. We have measured read ranges up to 25 feet on metal,” says **Jeff Nedblake**, principal and managing partner of Starport. Orion is expected to be commercially available by August.

Starport initially licensed ITTC RFID technology designed specifically to work on metal or objects containing liquid in rugged industrial environments in 2007. With the Agility technology, Starport gains a tag designed as a less expensive but less rugged alternative.

Agility technology achieves typical read ranges of more than three

## KTEC Assists Software, IT Industry

The Kansas Technology Enterprise Corporation (KTEC) has launched a statewide trade association to provide support to Kansas' burgeoning software and information technology (IT) industry. The non-profit group has been registered with the State as the Software and Information Technology Association of Kansas (SITAKS). It is designed to support Kansas software, information technology, and telecommunications companies. ■



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